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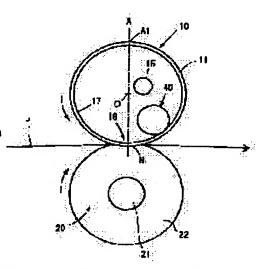
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# (54) FIXING DEVICE

# (57) Abstract:

PROBLEM TO BE SOLVED: To provide a fixing device that can shorten a warming-up time, has a simple the structure (control) of a heat generating body and can efficiently uniformize temperature distribution in the axial direction of a heating roller.

SOLUTION: Inside the hollow pipe type heating roller 10 with a heater 15 arranged inside, a high heat conductive roller 40 is arranged so that it may come into contact with the inner peripheral surface 17 of the roller 10 in the axial direction. The high heat conductive roller 40 is arranged near the downstream or near the upstream of a part 18 corresponding to the press contact position N with the pressure roller 20 in the rotating direction of the heating roller, and the heater 15 is arranged on the downstream side so as to be deviated from the rotational center of the heating roller.



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#### **CLAIMS**

## [Claim(s)]

[Claim 1] An anchorage device characterized by preparing in the interior a high temperature conduction member which contacts that inner skin in that direction of an axis inside said heating roller in an anchorage device equipped with a hollow pipe-like heating roller with which a heater has been arranged, and a pressurization roller by which the pressure welding is carried out to this heating roller.

[Claim 2] An anchorage device according to claim 1 characterized by said high temperature conduction member consisting of rollers.

[Claim 3] An anchorage device according to claim 1 or 2 with which said high temperature conduction member is characterized by contacting inner skin of a heating roller [ near the lower stream of a river of a part corresponding to a pressure—welding location with a pressurization roller ] about a hand of cut of a heating roller.

[Claim 4] An anchorage device according to claim 1 or 2 with which said high temperature conduction member is characterized by contacting inner skin of a heating roller [ near the upstream of a part corresponding to a pressure-welding location with a pressurization roller ] about a hand of cut of a heating roller.

[Claim 5] An anchorage device according to claim 1 or 2 characterized by preparing said at least two high temperature conduction members, for the one high temperature conduction member contacting inner skin of a heating roller about a hand of cut of a heating roller [ near the lower stream of a river of a part corresponding to a pressure—welding location with a pressurization roller ], and other one high temperature conduction member contacting inner skin of a heating roller [ near the upstream of said part ].

[Claim 6] It is an anchorage device given in any 1 term among claims 1–5 characterized by for said heater deflecting from the center of rotation of a heating roller, and arranging it about a hand of cut of a heating roller at the downstream of a part corresponding to a pressure—welding location with a pressurization roller.

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#### DETAILED DESCRIPTION

# [Detailed Description of the Invention]

[The technical field to which invention belongs] This invention relates to the anchorage device used for image formation equipments, such as a printer which can form a toner image in record material, such as a form, using electrophotographic technology, facsimile, and a copying machine.

## [0002]

[Description of the Prior Art] Generally the image formation equipment which forms a toner image on record material (only henceforth a form), such as a form, using electrophotographic technology The photo conductor by which a rotation drive is carried out, and an exposure means to be exposed to this photo conductor and to form an electrostatic latent image in the surface, It has the anchorage device which said electrostatic latent image is developed, and it heats [ anchorage device ], passing the form by which the toner image was imprinted with a toner image, the development means to make, an imprint means to make a form imprint that toner image, and this imprint means, and fixes a toner image on a form.

[0003] The conventional common anchorage device is equipped with the pressurization roller by which the pressure welding is carried out to the heating roller heated and this heating roller, with both [ these ] rollers, is heated compressing the form to pass and carries out melting fixing of the toner image on a form on a form.

[0004] In such an anchorage device, although it is desired for the temperature distribution in the direction of an axis of both rollers, especially a heating roller to be uniform Since heat is taken by the form (and toner) in the contact section with the form in both rollers and heat is not taken by the form in the non-contact section because a form passes the pressure-welding section of both rollers, When fixing actuation is performed especially continuously, compared with the above-mentioned contact section, the temperature of the non-contact section rises remarkably, and there is a problem that it becomes difficult to maintain the temperature distribution in the direction of an axis of both rollers to homogeneity as a result.

[0005] Then, in order to solve such a problem, the following technology is already proposed conventionally.

- (1) Prepare two or more heating elements with different exoergic distribution about the direction of an axis of a heating roller, and change the heating element to operate according to the temperature distribution of the heating roller at the time of fixing.
- (2) Raise the thermal conductivity and the heat capacity in the direction of an axis by enlarging the cross section of a heating roller, and attain equalization of temperature distribution.
- (3) As shown in <u>drawing 7</u>, to the surface of a heating roller 1, contact the member 3 of high temperature conductivity and attain equalization of temperature distribution (JP,8-87191,A). In addition, in <u>drawing 7</u>, 2 is a pressurization roller.

[Problem(s) to be Solved by the Invention] There are the respectively following problems in the Prior art mentioned above.

(1) Prepare two or more heating elements with different exoergic distribution about the direction

- of an axis of a heating roller, and with the technology of changing the heating element operated according to the temperature distribution of the heating roller at the time of fixing, the structure of a heating element portion and control are complicated and it is easy to cause an equipment failure.
- (2) raise the thermal conductivity and the heat capacity in the direction of an axis by enlarging the cross section of a heating roller, and with the technology of attaining equalization of temperature distribution, since the heat capacity of a heating roller becomes large, warm-up time (build up time until a heating roller reaches predetermined temperature) becomes long, consider as a result, and the futility of energy increases.
- (3) since the member 3 of high temperature conductivity is contacted and the high temperature conductivity member 3 touches to the surface of a heating roller 1 with the technology of attaining equalization of temperature distribution, to the surface of a heating roller 1 shown in drawing 7, heat release other than heating roller 1 from the high temperature conductivity member 3 becomes large, can not necessarily attain equalization of the temperature distribution in the direction of an axis of a heating roller efficiently, and there is. [ no ] [0007] It is easy (therefore, also in case of control), and the structure of warm-up time of a heating element portion is short, and ends [ the above problems are solved, ], and the purpose of this invention is to offer the anchorage device which can attain equalization of the temperature distribution in the direction of an axis of a heating roller efficiently.

[Means for Solving the Problem] In order to attain the above-mentioned purpose, an anchorage device according to claim 1 is characterized by preparing in the interior a high temperature conduction member which contacts that inner skin in that direction of an axis inside said heating roller in an anchorage device equipped with a hollow pipe-like heating roller with which a heater has been arranged, and a pressurization roller by which the pressure welding is carried out to this heating roller. An anchorage device according to claim 2 is characterized by said high temperature conduction member consisting of rollers in an anchorage device according to claim 1. An anchorage device according to claim 3 is characterized by said high temperature conduction member contacting inner skin of a heating roller about a hand of cut of a heating roller [ near the lower stream of a river of a part corresponding to a pressure-welding location with a pressurization roller ] in an anchorage device according to claim 1 or 2. An anchorage device according to claim 4 is characterized by said high temperature conduction member contacting inner skin of a heating roller about a hand of cut of a heating roller [ near the upstream of a part corresponding to a pressure-welding location with a pressurization roller ] in an anchorage device according to claim 1 or 2. An anchorage device according to claim 5 is set to an anchorage device according to claim 1 or 2. Said at least two high temperature conduction members are prepared. The one high temperature conduction member It is characterized by contacting inner skin of a heating roller [ near the lower stream of a river of a part corresponding to a pressure-welding location with a pressurization roller ], and other one high temperature conduction member contacting inner skin of a heating roller [ near the upstream of said part ] about a hand of cut of a heating roller. It is characterized by for said heater deflecting [ in / among claims 1-5 / an anchorage device given in any 1 term ] an anchorage device according to claim 6 from the center of rotation of a heating roller, and being arranged about a hand of cut of a heating roller at the downstream of a part corresponding to a pressure-welding location with a pressurization roller.

[0009]

[8000]

[Function and Effect] In the anchorage device which was equipped with the hollow pipe-like heating roller with which the heater has been arranged inside, and the pressurization roller by which the pressure welding is carried out to this heating roller according to the anchorage device according to claim 1 Since the high temperature conduction member which contacts the inner skin in the direction of an axis is prepared in the interior of said heating roller if the temperature distribution in the direction of an axis of a heating roller become an ununiformity, and it is going to become or, the heat of the elevated-temperature section in a heating roller will become possible [ maintaining temperature distribution / in / to the low-temperature section / the

direction of an axis of a heating roller / to homogeneity by propagation and this through a high temperature conduction member ]. And since what is necessary is just to prepare the high temperature conduction member which contacts the inner skin in the direction of an axis in the interior of a heating roller, it becomes unnecessary to prepare two or more heating elements, and the structure of a heating element portion and control are easy, and stop also being able to produce an equipment failure easily. Moreover, since it becomes unnecessary to enlarge the cross section of the heating roller itself, warm-up time is short and ends. Furthermore, since unlike what was shown in drawing 7 the high temperature conductivity member is prepared in the interior of a hollow pipe-like heating roller and the inner skin of a heating roller is contacted, heat release other than the heating roller from a high temperature conductivity member will decrease. and equalization of the temperature distribution in the direction of an axis of a heating roller will be efficiently attained as a result. That is, according to this anchorage device according to claim 1, it is simple for the structure of a heating element portion (therefore, also in case of control). and warm-up time is also short, it ends, and the effect that equalization of the temperature distribution in the direction of an axis of a heating roller can be attained efficiently is acquired. And although there was a difficulty that the surface of a heating roller 1 tends to deteriorate, and equipment is enlarged, in the conventional technology shown in drawing 7 since the high temperature conductivity member 3 touched the surface of a heating roller 1 Since according to this anchorage device according to claim 1 the high temperature conductivity member is prepared in the interior of a hollow pipe-like heating roller and contacts the inner skin of a heating roller, the surface of a heating roller does not deteriorate but the effect of not enlarging equipment, either is acquired. According to the anchorage device according to claim 2, in an anchorage device according to claim 1, since said high temperature conduction member consists of rollers, the touch area of a high temperature conductivity member and heating roller inner skin becomes large, and becomes possible [ attaining equalization of the temperature distribution in the direction of an axis of a heating roller much more efficiently ]. And since the high temperature conduction member consists of rollers, the effect that the rotation load of a heating roller does not increase compared with the case where a high temperature conduction member is constituted for example, from a slide contact member is also acquired. According to the anchorage device according to claim 3, in an anchorage device according to claim 1 or 2, since said high temperature conduction member contacts the inner skin of a heating roller about the hand of cut of a heating roller [ near the lower stream of a river of the part corresponding to a pressure-welding location with a pressurization roller ], it becomes possible [ attaining equalization of the temperature distribution in the direction of an axis of a heating roller much more efficiently ] so that it may explain below. Namely, as mentioned above, it sets to this kind of anchorage device. Since heat is taken by the form (and toner) in the contact section with the form in both rollers and heat is not taken by the form in the non-contact section because a form passes the pressure-welding section of a heating roller and a pressurization roller, The temperature distribution in the direction of an axis of a heating roller tend to become an ununiformity remarkably about the hand of cut of a heating roller [ near the lower stream of a river of the part corresponding to a pressure-welding location with a pressurization roller ]. According to this anchorage device according to claim 3, on the other hand, a high temperature conduction member The near lower stream of a river of the part corresponding to a pressurewelding location with a pressurization roller about the hand of cut of a heating roller Namely, since the temperature distribution in the direction of an axis of a heating roller tend to become an ununiformity remarkably and the inner skin of a heating roller is contacted in the big location of a temperature gradient The heat of the elevated-temperature section (part corresponding to the non-contact section with a form) in a heating roller will get across to the low-temperature section (part corresponding to the contact section with a form) efficiently through a high temperature conduction member. Therefore, it becomes possible to attain equalization of the temperature distribution in the direction of an axis of a heating roller much more efficiently. According to the anchorage device according to claim 4, it sets to an anchorage device according to claim 1 or 2. Since said high temperature conduction member contacts the inner skin of a heating roller about the hand of cut of a heating roller [ near the upstream of the part

corresponding to a pressure-welding location with a pressurization roller ] Just before a heating roller contacts a form, equalization of the temperature distribution in the direction of an axis will be attained, and the stable fixing condition will be acquired as a result. According to the anchorage device according to claim 5, it sets to an anchorage device according to claim 1 or 2. Said at least two high temperature conduction members are prepared. The one high temperature conduction member Since the inner skin of a heating roller is contacted [ near the lower stream of a river of the part corresponding to a pressure-welding location with a pressurization roller ] and other one high temperature conduction member contacts the inner skin of a heating roller [ near the upstream of said part ] about the hand of cut of a heating roller While equalization of the temperature distribution in the direction of an axis of a heating roller is efficiently attained in immediately after contact in a form by the one high temperature conduction member top The letter of fixing which equalization of the temperature distribution in the direction of an axis in front of contact in a form will be attained, and was further stabilized as a result by other one high temperature conduction member \*\* will be obtained. Among claims 1-5, in an anchorage device given in any 1 term, since said heater is deflecting from the center of rotation of a heating roller and is arranged about the hand of cut of a heating roller at the downstream of the part corresponding to a pressure-welding location with a pressurization roller, according to the anchorage device according to claim 6, it becomes possible [ attaining equalization of the temperature distribution in the direction of an axis of a heating roller much more efficiently ] so that it may explain below. Namely, as mentioned above, it sets to this kind of anchorage device. Since heat is taken by the form (and toner) in the contact section with the form in both rollers and heat is not taken by the form in the non-contact section because a form passes the pressure-welding section of a heating roller and a pressurization roller. The temperature distribution in the direction of an axis of a heating roller tend to become an ununiformity about the hand of cut of a heating roller in the downstream of the part corresponding to a pressurewelding location with a pressurization roller. On the other hand, since according to this anchorage device according to claim 6 the heater is deflecting from the center of rotation of a heating roller and the temperature of a contact part with the form in the downstream of an axis of the part corresponding to a pressure-welding location with a pressurization roller, i.e., the direction of a heating roller, is arranged about the hand of cut of a heating roller in the low location, the heat supply from the heater to that low-temperature section will be made efficiently. Therefore, it becomes possible to attain equalization of the temperature distribution in the direction of an axis of a heating roller much more efficiently. It follows, and this configuration according to claim 6 becomes effective especially, when it combines with the configuration of above-mentioned claim 3. [0010]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing.

Partial abbreviation III-III end view [ in / the outline front view and drawing 2 which show the important section of the gestalt of operation of the 1st of the anchorage device which \( \)gestalt of the 1st operation \( \) drawing 1 requires for this invention, and \( \) in drawing 3 / drawing 2 \( \), and drawing 4 are the expanded sectional views of a heating roller. [ a positive cross section ] [0011] As shown in these drawings, this anchorage device is equipped with the pressurization roller 20 by which the pressure welding is carried out to a heating roller 10 and this heating roller 10.

[0012] As a heating roller 10 is shown in <u>drawing 4</u>, it has the metal pipe 11, the elastic layer 12 covered by the surface, and surface (for example, PFA layer) 12a further covered by the surface, and as shown in <u>drawing 1</u> and <u>drawing 2</u>, the both ends of a pipe 11 are supported by the frame 30 of an anchorage device pivotable by the bearing 13 and the supporter material 14. The heater 15 which is an exoergic means is inserted in the interior of a pipe 11, and a heating roller 10 is heated at this heater 15. The gear 16 is being fixed to that end and the rotation drive of the heating roller 10 is carried out by having geared with the gear of the drive which has the motor which this gear 16 does not illustrate.

[0013] Moreover, the high temperature conduction member 40 which contacts the inner skin 17

in the direction of an axis (it sets to <u>drawing 2</u> and is a longitudinal direction) is formed in the interior of a heating roller 10. The high temperature conduction member 40 can be constituted from a material with the high thermal conductivity of aluminum, copper, etc., and the roller which consists of aluminum constitutes it from the gestalt of this operation. Furthermore, the gestalt of this operation has covered the surface (contact surface with the inner skin 17 of a heating roller 10) of the high temperature conduction roller 40 in the elastic layer 41 of high temperature conductivity, in order to make contact to the inner skin 17 of a heating roller 10 certainly and smooth and to extend a touch area further, as shown in drawing 4. As shown in drawing 2, the shaft 42 of those both ends is supported by the bearing 43 pivotable, and a pressure welding is carried out to the inner skin 17 of the heating roller 10 by this bearing 43 being energized towards the inner skin 17 of a heating roller 10 with the spring 44, and it follows and rotates the high temperature conduction roller 40 to a heating roller 10. As shown in drawing 3, the high temperature conduction roller 40 touches the inner skin 17 of a heating roller 10 [ near the lower stream of a river of the part 18 corresponding to the pressure-welding location N with the pressurization roller 20 ] about the hand of cut (it sets to drawing 3 and is a counterclockwise rotation) of a heating roller 10.

[0014] As shown in drawing 3, the heater 15 is deflected from the center of rotation O of a heating roller 10, and is arranged about the hand of cut of a heating roller 10 at the downstream of the part 18 corresponding to the pressure-welding location N with the pressurization roller 20. In addition, as shown in drawing 3, when the heating roller 10 is carried out for 2 minutes by the center of rotation O and the segment (normal of the pressure-welding section N) A which passes along the pressure-welding section (pressure-welding location) N, The field (it sets to drawing 3 and is on the right-hand side of Segment A) which reaches the division location A1 located from the pressure-welding section N along the hand of cut of a heating roller 10 in the opposition was called downstream, and the field (it sets to drawing 3 and is on the left-hand side of Segment A) from the division location A1 to the pressure-welding section N is called upstream. In drawing 1 and drawing 2, 15a and 15a are supporter material which is supporting the heater 15 on the frame 30.

[0015] It has the shaft 21 and the elastic body 22 with which the surroundings of this shaft 21 were equipped, the both ends of a shaft 21 are supported by the bearing 23 pivotable, and the pressure welding of the pressurization roller 20 is carried out to the heating roller 10 by this bearing 23 being energized towards a heating roller 10 with the pressurization spring 24, and it is followed and rotated to a heating roller 10.

[0016] A toner image is fixed on Form P by heating them, the above anchorage devices passing the form P by which the toner image was imprinted with the imprint means which is not illustrated in the pressure—welding section N of a heating roller 10 and the pressurization roller 20 in the direction shown in <u>drawing 3</u> by the arrow head. In addition, in <u>drawing 1</u>, P has shown an example of the passage range of a form (copy paper field).

[0017] According to the above anchorage devices, the following operation effects are acquired. (a) The hollow pipe-like heating roller 10 with which the heater 15 has been arranged inside, Since it has the pressurization roller 20 by which the pressure welding is carried out to this heating roller 10 and the high temperature conduction member 40 which contacts that inner skin 17 in that direction of an axis is formed in the interior of a heating roller 10 if the temperature distribution in the direction of an axis of a heating roller 10 become an ununiformity, and it is going to become or -- As the heat of the elevated-temperature section (for example, part 10a which is equivalent to the both ends of the \*\*\*\* field P in drawing 1 (refer to drawing 2)) in a heating roller 10 shows drawing 2 by the arrow head a through the high temperature conduction member 40, to the low-temperature section (for example, part 10b which is equivalent to the \*\*\*\* field P in drawing 1 (refer to drawing 2)) Propagation, It becomes possible to maintain the temperature distribution in the direction of an axis of a heating roller 10 to homogeneity by this. And since what is necessary is just to form the high temperature conduction member 40 which contacts the inner skin 17 in the direction of an axis in the interior of a heating roller 10, it becomes unnecessary to prepare plurality for a heating element 15, and the structure of heating element 14 portion and control are easy, and stop also being able to produce an equipment

failure easily. Moreover, since the necessity of enlarging the cross section of heating roller 10 the very thing (for example, a pipe 11 being made thick) is also lost, warm-up time is short and ends. Furthermore, since the high temperature conductivity member 40 is formed in the interior of the hollow pipe-like heating roller 10 unlike what was shown in drawing 7 and the inner skin 17 of a heating roller 10 is contacted, heat release other than heating roller 10 from the high temperature conductivity member 40 decreases. That is, the heat of the high temperature conductivity member 40 will get across to a heating roller 10 through the building envelope of a heating roller 10 in addition to the contact section with the inner skin 17 of a heating roller 10. Therefore, equalization of the temperature distribution in the direction of an axis of the heating roller 10 will be attained efficiently. That is, according to this anchorage device, it is simple for the structure of a heating element portion (therefore, also in case of control), and warm-up time is also short, it ends, and the effect that equalization of the temperature distribution in the direction of an axis of the heating roller 10 can be attained efficiently is acquired. And although there was a difficulty that the surface of a heating roller 1 tends to deteriorate, and equipment is enlarged, in the conventional technology shown in drawing 7 since the high temperature conductivity member 3 touched the surface of a heating roller 1 Since according to the anchorage device of the gestalt of this operation the high temperature conductivity member 40 is formed in the interior of the hollow pipe-like heating roller 10 and contacts the inner skin 17 of a heating roller 10, the surface of a heating roller 10 does not deteriorate but the effect of not enlarging equipment, either is acquired.

- (b) Since the high temperature conduction member 40 consists of rollers, the touch area of the high temperature conductivity member 40 and the heating roller inner skin 17 becomes large, and becomes possible [ attaining equalization of the temperature distribution in the direction of an axis of the heating roller 10 much more efficiently ]. And since the high temperature conduction member 40 consists of rollers, the effect that the rotation load of a heating roller 10 does not increase compared with the case where the high temperature conduction member 40 is constituted for example, from a slide contact member is also acquired. Furthermore, with the gestalt of this operation, since the surface (contact surface with the inner skin 17 of a heating roller 10) of the high temperature conduction roller 40 is covered with the elastic layer 41 of high temperature conductivity as shown in drawing 4, while contact to the inner skin 17 of a heating roller 10 becomes certainly and smooth, a touch area also increases further and becomes possible [ attaining equalization of the temperature distribution in the direction of an axis of the heating roller 10 much more efficiently ].
- (c) Since the high temperature conduction member 40 contacts the inner skin 17 of a heating roller 10 about the hand of cut of a heating roller 10 [ near the lower stream of a river of the part 18 corresponding to the pressure-welding location N with the pressurization roller 20 J, it becomes possible [ attaining equalization of the temperature distribution in the direction of an axis of the heating roller 10 much more efficiently ] so that it may explain below. Namely, it is that Form P passes the pressure-welding section N of a heating roller 10 and the pressurization roller 20 in this kind of anchorage device. Since heat is taken by the form (and toner) in the contact section with the form P in both the rollers 10 and 20 and heat is not taken by Form P in the non-contact section, Supposing it does not adopt any means, either, the temperature distribution in the direction of an axis of a heating roller 10 will tend to become an ununiformity remarkably about the hand of cut of a heating roller 10 [ near the lower stream of a river of the part 18 corresponding to the pressure-welding location N with the pressurization roller  $20\ 
  m J.$ According to the anchorage device of the gestalt of this operation, on the other hand, the high temperature conduction member 40 The near lower stream of a river of the part 18 corresponding to the pressure~welding location N with the pressurization roller 20 about the hand of cut of a heating roller 10 Namely, since the inner skin 17 of a heating roller 10 is contacted in the location where the temperature distribution in the direction of an axis of a heating roller 10 tend to become an ununiformity remarkably, and a temperature gradient tends to become large The heat of elevated-temperature section (part corresponding to the noncontact section with form) 10a in a heating roller 10 will get across to low-temperature section (part corresponding to the contact section with form) 10b efficiently through the high

temperature conduction member 40. Therefore, it becomes possible to attain equalization of the temperature distribution in the direction of an axis of the heating roller 10 much more efficiently.

(d) Since the heater 15 is arrange in the location where it is deflect from the center of rotation O of a heating roller 10, and the downstream of the part 18 corresponding to the pressure welding location N with the pressurization roller 20, i.e., the temperature of a contact part with the form [ in / as mention above / the direction of an axis of the heating roller 10 ] P, becomes low about the hand of cut of a heating roller 10, the heat supply from the heater 15 to the low-temperature section will be make efficiently. Therefore, it becomes possible to attain equalization of the temperature distribution in the direction of an axis of the heating roller 10 much more efficiently. And as mentioned above, since the high temperature conduction member 40 contacts the inner skin 17 of a heating roller 10 about the hand of cut of a heating roller 10 [ near the lower stream of a river of the part 18 corresponding to the pressure—welding location N with the pressurization roller 20 ], it becomes possible [ attaining equalization of the temperature distribution in the direction of an axis of the heating roller 10 much more efficiently ].

[0018] (Gestalt of the 2nd operation) drawing 5 is the outline cross section (drawing equivalent to the III-III end face in drawing 2 ) showing the important section of the gestalt of operation of the 2nd of the anchorage device concerning this invention. In drawing 5, the same sign is given to the same portion as a gestalt thru/or the corresponding portion of implementation of the above 1st. The point that the gestalt of this operation differs from the gestalt of implementation of the above 1st has the high temperature conduction member 40 in the point that it is [ / near the upstream of the part 18 corresponding to the pressure-welding location N with the pressurization roller 20 ] in contact with the inner skin 17 of a heating roller 10, about the hand of cut of a heating roller 10, and there is no change in other points. The same effect as the above (a) by the gestalt of the 1st operation, (b), and (d) is acquired also according to the gestalt of this operation. Moreover, since the high temperature conduction member 40 touches the inner skin 17 of a heating roller 10 about the hand of cut of a heating roller 10 [ near the upstream of the part 18 corresponding to the pressure-welding location N with the pressurization roller 20 ], just before a heating roller 10 contacts Form P, equalization of the temperature distribution in the direction of an axis will be attained, and the stable fixing condition will be acquired as a result.

[0019] <Gestalt of the 3rd operation> drawing 6 is the outline cross section (drawing equivalent to the III-III end face in drawing 2) showing the important section of the gestalt of operation of the 3rd of the anchorage device concerning this invention. In drawing 6, the same sign is given to the same portion as a gestalt thru/or the corresponding portion of implementation of the above 1st. The point that the gestalt of this operation differs from the gestalt of implementation of the above 1st Two high temperature conduction members (40 40') are prepared. The one high temperature conduction member 40 The inner skin 17 of a heating roller 10 is contacted about the hand of cut of a heating roller 10 [ near the lower stream of a river of the part 18 corresponding to the pressure-welding location N with the pressurization roller 20]. Other one high temperature conduction member 40' is in the point of contacting the inner skin 17 of a heating roller 10 [ near the upstream of said part 18], and there is no change in other points. According to the gestalt of this operation, the operation effect by the gestalt of the above 1st and the 2nd implementation will be acquired by coincidence.

[0020] As mentioned above, although the gestalt of operation of this invention was explained, this invention is not limited to the gestalt of the above-mentioned operation, and deformation implementation is possible for it suitably within the limits of the summary of this invention. For example, invention of those other than \*\* claim 2 may constitute the high temperature conduction roller 40 from the member which \*\*\*\*s to the inner skin 17 of a heating roller 10 instead of a roller.

\*\* Only when you make it fixed to the small size paper (small form of the above-mentioned \*\*\*\* field P (width of face)) in which an attachment-and-detachment device is established to the high temperature conduction member 40, and especially temperature distribution tend to become an

ununiformity The high temperature conduction member 40 is made to contact the inner skin 17 of a heating roller 10. In being other (large size paper with high operating frequency (for example, A4 size paper)) By not making it contact, the warm-up time of a making [ you / fixed to a form with high operating frequency ] case can be shortened remarkably.

\*\* Two or more high temperature conduction members 40 may be formed.

[0021]

[Effect of the Invention] By any anchorage device according to claim 1 to 6, it is simple for the structure of a heating element portion (therefore, also in case of control), and warm-up time is also short, it ends, and the effect that equalization of the temperature distribution in the direction of an axis of a heating roller can be attained efficiently is acquired. And the surface of a heating roller does not deteriorate but the effect of not enlarging equipment, either is also acquired. Furthermore, while becoming possible to attain equalization of the temperature distribution in the direction of an axis of a heating roller much more efficiently according to the anchorage device according to claim 2, the effect that the rotation load of a heating roller does not increase is acquired. According to the anchorage device according to claim 3, it becomes possible to attain equalization of the temperature distribution in the direction of an axis of a heating roller much more efficiently. According to the anchorage device according to claim 4, the stable fixing condition will be acquired. According to the anchorage device according to claim 5, the fixing condition stabilized further will be acquired. According to the anchorage device according to claim 6, it becomes possible to attain equalization of the temperature distribution in the direction of an axis of a heating roller much more efficiently. [0022]

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### **DESCRIPTION OF DRAWINGS**

[Brief Description of the Drawings]

[Drawing 1] Outline front view showing the important section of the gestalt of operation of the 1st of the anchorage device concerning this invention.

[Drawing 2] A positive cross section same as the above.

[Drawing 3] Partial abbreviation III-III end view in drawing 2.

[Drawing 4] The expanded sectional view of a heating roller.

[Drawing 5] The outline cross section showing the important section of the gestalt of operation of the 2nd of the anchorage device concerning this invention (drawing equivalent to the III-III end face in drawing 2).

[Drawing 6] The outline cross section showing the important section of the gestalt of operation of the 3rd of the anchorage device concerning this invention (drawing equivalent to the III-III end face in drawing 2).

[Drawing 7] Explanatory drawing of the conventional technology.

[Description of Notations]

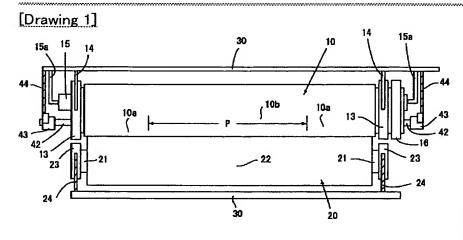
- 10 Heating Roller
- 15 Heater
- 17 Inner Skin
- 20 Pressurization Roller
- 40 High Temperature Conduction Roller (High Temperature Conduction Member)
- N Pressure-welding location

[Translation done.]

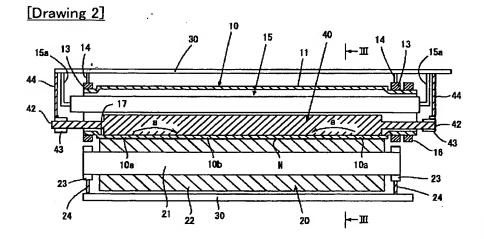
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## **DRAWINGS**

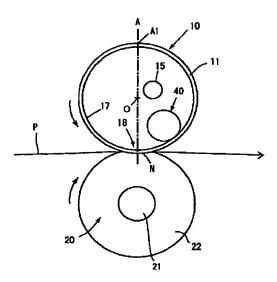


2857-0



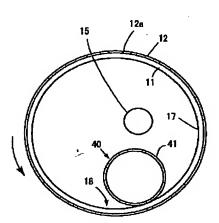
2857-0

# [Drawing 3]



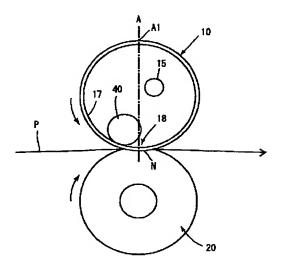
[Drawing 4]

82857-04



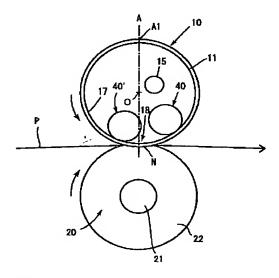
[Drawing 5]

82857-05



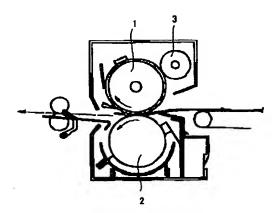
[Drawing 6]

82857-06



[Drawing 7]

82857-07



[Translation done.]

(19) 日本国格部庁 (JP)

数 4 盐 华 噩 4 <del>(</del>2

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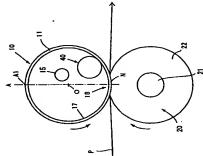
п

(54) [発明の名称] 定着装置

【映題】 発釈体部分の構造 (制御) が簡単でウォーム アップ時間も短くて浴み、治谷的に加黙ローラの監線方 向における温度分布の均一化を図る。

る。高熱伝導ローラ40は、加熱ローラの回転方向に関 し、加圧ローラ20との圧接位置Nに対応する部位18 の下流近傍または上流近傍に設け、ヒータ15は、加熱 【解決手段】 内部にヒータ15が配置された中空パイ プ状の加密ローラ100内部に、その軸線方向において その内周面17と接触する高點伝導ローラ40を設け ローラの回覧中心から臨係させて下消倒に配置する。

82857-03



特開2002-268430

ම

作作語状の範囲】

請求項1] 内部にヒータが配置された中空パイプ状 の加黙ローラと、この加黙ローラに圧接されている加圧 ローラとを備えた定着装置において、

位配加製ローアの内部に、その複数方向においてその内 周面と接触する高熱伝導部材が散けられていることを特 散とする定着装置。 [請求項2] 前記萬點伝導部材がローラで構成されて いることを特徴とする請求項1配載の定籍装置。

「酵水項3】 前記高熱伝導部材が、加熱ローラの回転 方向に関し、加圧ローラとの圧接位置に対応する部位の 下流近傍において加熱ローラの内周面と接触することを 特徴とする請求項1または2配載の定着装置。

前記高祭伝導部材が、加祭ローラの回転 方向に関し、加圧ローラとの圧接位置に対応する部位の 上流近傍において加熱ローラの内固面と接触することを 特徴とする請求項1または2記載の定着装置。 罪长伍4]

の回転方向に関し、加圧ローラとの圧接位置に対応する 「諸求風5」 前記電影伝導部材が、少なくとも2つ数 けられていて、その1つの地窓伝導部材が、加索ローラ て加熱ローラの内周面と接触することを特徴とする請求 他の1つの高黙伝導部材が、前配部位の上流近傍におい 部位の下流近傍において加敷ローラの内周面と接触し、 項1または2配載の定着装置。

【語水項6】 前記ヒータが、加黙ローラの回転中心か 加田ローラとの圧接位置に対応する部位の下流側に配置 されていることを特徴とする請求項1~5のうちいずれ **ら臨後しており、かり、加黙ローテの回転方向に慰し、** か1項に記載の庇着装置。

[発明の詳細な説明]

0001]

|発明の属する技術分野||本発明は、電子写真技術を用 るプリンター、ファクシミリ、複写機等の画像形成装置 いて用紙苺の記録材にトナー画像を形成することのかき に用いられる定着装置に関するものである。

0002

【従来の技術】一般に、電子写真技術を用いて用紙等の 体に腐光して安面に静電潜像を形成する腐光手段と、前 年段によりトナー画像が転写された用紙を通過させつつ 5 画像形成装置は、回転駆動される感光体と、この感光 記辞電階像を現像してトナー画像となす現像手段と、そ のトナー画像を用紙に転写させる転写手段と、この転写 加熱して用紙上にトナー画像を定着させる定着装置とを 記録材 (以下単に用紙という) 上にトナー画像を形成す

[0003] 従来の一般的な定権装置は、加敷される加 とを備えており、これら両ローラによって、通過する用 幣ローラとこの物幣ローラに圧接されている加圧ローラ **取を校田ししし加黙し、用紙上のトナー画像を用紙上に** 容融定着させるようになっている。

であることが望まれるが、両ローラの圧接部を用紙が通 ラ、特に加熱ローラの軸線方向における温度分布が均一 ては用板(およびトナー)に敷が奪われ、非接触部にお いては用紙に熟が奪われないため、特に、連続して定着 が著しく上昇し、結果として、両ローラの軸線方向にお ける温度分布を均一に維持することが困難になるという 過することで、両ローラにおける用紙との接触部におい 動作が行われると、上記接触部に比べて非接触部の温度 【0004】このような応着装置においては、両ロー 問題がある。 2

[0005] そこで、このような問題を解決するため に、従来、次のような技術がすでに提案されている。

もつ発釈体を複数用意し、定着時の加黙ローラの温度分 (1) 加黙ローラの軸線方向に関して異なる発釈分布を 布に応じて、作動させる発熱体を変更する。

(2) 加帆ローラの断面積を大きくすることで軸線方向 における釈伝導性および釈容量を高め、温度分布の均一 化を図る。

高熈伝導性の部材3を接触させて、温度分布の均一化を (3) 図7に示すように、加勲ローラ1の費面に対し、 図る (特開平8-87191号)。 なお、図1におい て、2は加圧ローラである。 ន

[9000]

[発明が解決しようとする課題] 上述した従来の技術に は、それぞれ次のような問題がある。 (1) 加穀ローラの軸線方向に関して異なる発熱分布を 布に応じて作動させる発散体を変更する技術では、発黙 もし発飲体を複数用意し、定着時の加製ローラの温度分 体部分の構造や制御が複雑化し、機器の故障を招きやす ജ

(2) 加熱ローラの断面褶を大きくすることで軸繰方向 化を図る技術では、加熱ローラの熱容量が大きくなるた め、ウォームアップ時間(加熱ローラが所定温度に達す るまでの立ち上がり時間)が長くなり、結果としてエネ における駅伝導性および航容盘を高め、温度分布の均一 ケメーの無駄が多へなる。

(3) 図7に示した、台幣ローラ1の敷面に対し、通幣 伝導性の部材3を接触させて、温度分布の均一化を図る 技術では、加敷ローラ1の数固に対して高熱伝導性部材 3が被触しているので、 極黙伝導性部材3からの加黙ロ ーラ1以外への放釈量が大きくなり、必ずしも効率的に 加熱ローラの軸線方向における温度分布の均一化を図る ことができない。 \$

[0007] この発明の目的は、以上のような問題を解 **決し、発旣体部分の構造が(したがって制御も)簡単で** ウォームアップ時間も無くて資み、効學的に加熱ローラ の軸線方向における温度分布の均一化を図ることができ る定着装置を提供することにある。

[限題を解決するための手段] 上配目的を達成するため

S

に請求項1記載の定着装置は、内部にヒータが配置され た中位パイプ状の加戦ローラン、この加戦ローラに圧扱 されている加圧ローラとを備えた定着装置において、前 **着装置において、前配高熱伝導部材がローラで構成され** 請求項1または2記載の定着装置において、前記高熱伝 導部材が、加熱ローラの回転方向に関し、加圧ローラと の仮格装置において、哲配複影伝導部材が、少なくとも 2 し数 すられ たった、 その 1 しの 鬼蛇 府 御 哲 だっぱ ローラの回転方向に関し、加圧ローラとの圧接位置に対 応する部位の下流近傍において加密ローラの内周面と被 る。請求項6記載の定着装置は、請求項1~5のうちい **哲戦ローアの回鶻中心やの解係したおり、から、 招戦ロ ーラの回転方向に関し、加圧コーラとの圧接位置に対応** 的加数ローッの内部に、その監禁方向においてその内面 面と接触する高熱伝導部材が設けられていることを特徴 とする。請求項2記載の定磐装置は、請求項1記載の定 の圧接位置に対応する割位の下流近傍において加黙ロー ラの内周面と接触することを卒散とする。請求項4記載 の定着装置は、請求項1また; 12配載の定着装置におい し、加圧ローラとの圧接位置に対応する部位の上流近傍 において加熱ローラの内周面と接触することを特徴とす る。請求項5記載の定着装置は、請求項1または2記載 触し、他の1 つの高繁伝導部なが、前記部位の上流近傍 において加熱ローラの内周面と接触することを特徴とす する部位の下流側に配置されていることを特徴とする。 ていることを特徴とする。請求項3配載の定益装置は、 て、前記高熱伝導部材が、加索ローラの回転方向に関 ずれか1項に記載の定着装置において、前記ヒータが、

[作用効果] 請求項1記載の定権装置によれば、内部に ラ以外への放漑量が少なくなり、結果として効率的に加 ヒータが配置された中空パイプ状の加熱ローラと、この 加熱ローラに圧接されている加圧ローラとを備えた定着 装置において、前記加熱ローラの内部に、その軸線方向 においてその内周面と接触する高熱伝導部材が設けられ ているので、加熱ローラの軸線方向における温度分布が 不均一になると (あるいはなろうとすると)、 加敷ロー ラにおける高温部の熱が高熱伝導部材を介して低温部へ 複数の発釈体を用意する必要がなくなり、発釈体部分の ノ状の打戦ローアの左右に設けられていて打戦ローアの 内周面と接触するので、高熱伝導性部材からの加熱ロー と伝わり、これによって、加熱ローラの植様方向におけ また、加熱ローラ自体の断面積を大きくする必要もなく 図りに示したものと異なり、高熱伝導性部材は中空パイ 周面と被触する高熱伝導部材を設けるだけでよいので、 なるので、ウォームアップ時間が知くて済む。さらに、 る温度分布を均一に維持することが可能となる。そし 構造および制御が簡単で、機器の故障も生じ雛くなる。

によれば、発熱体部分の構造が(したがって制御も)節 できるという効果が得られる。しかも、図7に示した従 来技術においては、高祭伝導性部材 3 が加級ローラ 1 の 数面に接触しているので、加敷ローラ1の数面が劣化し が、この請求項1記載の定着装置によれば、高熱伝導性 いて加製ローラの内国面と被触するので、加製ローラの **要面が劣化せず、装置も大型化しないという効果が得ら** れる。請求項2記載の定着装置によれば、請求項1記載 の定着装置において、前記高敷伝導部材がローラで構成 の接触面徴が広くなり、一層効率的に加熱ローラの軸線 る。しかも、高熱伝導部材がローラで構成されているの で、高熟伝導部材を例えば褶接部材で構成した場合に比 ペイ加幣ローラの回転食物が抽大しないという効果も毎 られる。請求項3記載の定着装置によれば、請求項1ま に対応する部位の下流近傍において加密ローラの内周面 と接触するので、以下に説明するように、一層効率的に 加熱ローラの軸線方向における温度分布の均一化を図る ことが可能となる。すなわち、前述したように、この種 の定着装置においては、加勲ローラと加圧ローラとの圧 梭部を用紙が通過することで、両ローラにおける用紙と ることとなる。すなわち、この請求項1配載の定着装置 **ーラの軸線方向における温度分布の均一化を図ることが** 部材が、中位パイプ状の加敷ローラの内部に敷けられて されているので、高熱伝導性部材と加黙ローラ内周面と 単でウォームアップ時間も短くて資み、効率的に加熱ロ 加熱ローラの回転方向に関し、加圧ローラとの圧接位置 方向における温度分布の均一化を図ることが可能とな たは2記載の定着装置において、前記高繁伝導部材が、 の接触部においては用紙(およびトナー)に熟が奪わ やすく、また、装置が大型化するという難点があった ೫

れ、非接触部においては用紙に熟が奪われないため、加 **熟ローラの軸線方向における温度分布は、加熱ローラの** 回転方向に関し、加圧ローラとの圧接位置に対応する部 位の下流近傍において箸しく不均一になりやすい。 これ に対し、この請求項3記載の定着装置によれば、高熱伝 導部材が、加熱ローラの回転方向に関し、加圧ローラと の圧接位置に対応する部位の下流近傍、すなわち加熱ロ **一ラの軸様方向における温度分布が著しく不均一になり** やすく、値段物の大きな位置において加製ローラの内面 面と接触するので、加熱ローラにおける高温部(用紙と の非接触部に対応する部位)の熱が高熱伝導部材を介し て毎温部(用紙との被触部に対応する部位)へ効率的に ラの軸線方向における温度分布の均一化を図ることが可 が、加敷ローラの回転方向に関し、加圧ローラとの圧換 位置に対応する部位の上流近傍において加黙ローラの内 周面と接触するので、加勲ローラが用紙と接触する直前 伝わることとなる。したがって、一層効略的に加戦ロー 能となる。情水項4配載の定着装置によれば、精水項1 または2記載の定着装置において、前記高熱伝導部材

の接触直後において効率的に加熱ローラの軸線方向にお 下に説明するように、一層効率的に加熱ローラの軸線方 着装置によれば、ヒータが、加熱ローラの回転中心から 臨街しており、かつ、加熱ローラの回転方向に関し、加 請求項1または2記載の定着装置において、前記高熱伝 **ーラとの圧接位置に対応する部位の下流近傍において加** となる。請求項6配載の定着装置によれば、請求項1~ 5のうちいずれか1項に記載の定着装置において、前記 ヒータが、加敷ローラの回転中心から偏倚しており、か つ、加熱ローラの回転方向に関し、加圧ローラとの圧接 位置に対応する部位の下流側に配置されているので、以 ることで、面ローラにおける用紙との複触部においては ローラとの圧接位置に対応する部位の下流側において不 均一になりやすい。これに対し、この請求項6記載の定 圧ローラとの圧接位置に対応する部位の下流側すなわち 加熱ローラの軸線方向における用紙との接触部位の温度 が低い位置に配置されているので、その低温部に対する ヒータからの際供給が効率的になされることとなる。し たがった、一層効率的に加密ローテの結構方向における られることとなり、結果として、安定した定着状態が得 導部材が、少なくとも20数けられていて、その100 高熱伝導部材が、加熱ローラの回転方向に関し、加圧ロ が、前配部位の上流近傍において加熱ローラの内周面と 敬勉するのか、1 しの複整仮導部な上にいった、 用紙や ける阎既分布の均一化が図られるとともに、他の1つの **高熱伝導部材によって、用紙との接触直前における輻線 毎果として、より一層安定した定着状態が得られること すなわち、前述したように、この種の定着装置において** は、加熱ローラと加圧ローラとの圧接部を用紙が通過す 用紙(およびトナー)に繋が奪われ、非接触部において は用紙に熟が奪われないため、加税ローラの軸線方向に おける温度分布は、加熱ローラの回転方向に関し、加圧 方向における温度分布の均一化が図られることとなり、 向における温度分布の均一化を図ることが可能となる。 られることとなる。鏡水頃5記載の定着装置によれば、 黙ローラの内周面と被触し、他の1 つの高駅伝導部材

[0010] [発明の実施の形態] 以下、本発明の実施の形態につい 区図面を参照して説明する。

て、また、この請求項6記載の構成は、上記請求項3の

隋成と組み合わせた場合に特に有効になる。

温度分布の均一化を図ることが可能となる。したがっ

(第10実施の形態>図1は本発明に係る応着装置の第10実施の形態の影館を示す機略正面図、図2は正断固図、図3は図2における飽分省略111-111端回図、図4は加載ローラの拡大幣面図である。

[0011] これらの図に示すように、この定着装置は、加黙ローラ10とこの加黙ローラ10に圧焼されている加圧ローラ20とを備えている。 [0012]加黙ローラ10は、図4に示すように、会

において、その軸線方向における温度分布の均一化が図

S

戦ローラの軸線方向における。<br />
温度分布の均一化が図られ

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**届製のパイプ11と、その表面に被覆された導柱圏12と、さらにその表面に粧覆された装稿 (例えばPFA面) 12 a とを傷えており、図1, 図2にボすように、パイブ11の両部部が軸受け13 および支持部対14によって、定着装置のソレーム30に回転可能に支持されて、15が増通されており、このヒータ15によって加密ローラ10が加熱される。加密ローラ10に、その一端にギブ16が固定されており、このギブ16が図示した・モータを有する郵動機構のギアに随み合っていることにモークを有する郵動機構のギアに随み合っていることに** 

よって回転駆動される。

[0013]また、加熱ローラ10の内部には、その軸 7と接触する高敷伝導部材40が設けられている。 高黙 材料で構成することができ、この実施の形態では例えば 触面積を広げるために、高熱伝導ローラ40の数面(加 って回転可能に支持されており、この軸受け43が、パ 伝導的材40は、アルミニウムや餌等の敷伝導率の高い 0の内周面17との徴触を確実かつ円滑にし、さらに投 熟ローラ10の内周面17との接触面)を、高敷伝導性 の母性国41で被覆してある。図2に示すように、高熱 ネ44により加製ローラ10の内周面17~向けて付勢 うに、高熱伝導ローラ40は、加熱ローラ10の回転方 向 (図3において反時計方向) に関し、加圧ローラ20 との圧接位置Nに対応する部位18の下流近傍において 伝導ローラ40は、その固緒の軸42が軸受け43によ されていることで加熱ローラ10の内周面17に圧接さ 九、右舷ローラ10に狩動して回転する。図3に示すよ 様方向 (図2において左右方向) においてその内周面1 この実施の形態では、図4に示すように、加数ローラ1 アルミニウムからなるローテで構成してわる。さらに、 加熱ローラ10の内周面17と接触している。 8

[0014] 図3に示すように、ヒータ15は、加密ローラ10の回転中心のから傾衝しており、かつ、加密ローラ10の回転力向に関し、加圧ローラ20との圧破位置いて対応する部位18の下流側に配置されている。なお、図3に示すように、回転中心の上在整節(圧破位置) Nを追る様分(圧接部の登録) Aで加速ローフ10を2分したとき、加配ローフ10の回転力向に沿って圧接部いからその反対位置にある分割位置 A1に至るの 領域(図3において様分Aの左側)を上流回といっている。図1,図2において、15a1、と・タ15をフレーム30に対けている方数部は好くある。

[0015]加圧ローテ20は、韓21と、この韓21の回りに装着された単性を22とを有しており、韓21の国施部が韓受け23によって回転可能に支持されており、この韓受け23が、加圧パネ24により加戦ローフ10へ向けて付勢されていることで加戦ローラ10に圧50級され、加戦ローラ10に従動して回覧する。

[0017] 以上のような定替装置によれば、次のよう な作用効果が得られる。

熟ローラ10と、この加熱ローラ10に圧接されている イン状の指数ローシ100左部に数けられたいた指数ロ (a) 内部にヒータ15が配置された中空パイプ状の加 の軸線方向においてその内周面17と接触する高熱伝導 部材40が設けられているので、加敷ローラ10の輪線 うとすると)、加熱ローラ10における高温館(例えば (図2参照)) の影が複繁伝導部な40を介して図2に 矢印 a で示すように低温部(列えば図1において通紙質 これによって、加熱ローラ10の輪線方向における温度 分布を均一に維持することが可能となる。そして、加敷 ローラ10の内部に、その軸線方向においてその内周面 17と接触する高熱伝導部材40を散けるだけでよいの で、発熱体15を複数を用意する必要がなくなり、発熱 体14部分の構造および制御が簡単で、機器の故障も生 じ難くなる。また、加熱ローラ10自体の断面積を大き くする (例えばパイプ11を肉厚にする) 必要もなくな るので、ウォームアップ時間が短くて済む。さらに、図 7 に示したものと異なり、商熟伝導性部材 4 0 は中空パ 一ラ10の内阁面17と接触するので、高熱伝導性部材 る。すなわち、高熱伝導性節対40の熟は、加熱ローラ 10の内部空間を超て加黙ローラ10へ伝わることとな る。したがって、効率的に加密ローラ10の輻接方向に おける温度分布の均一化が図られることとなる。すなわ ち、この定着装置によれば、発船体部分の構造が(した 加圧ローラ20とを備え、加黙ローラ10の内部に、そ 方向における温度分布が不均一になると (あるいはなろ 図1において通紙領域Pの両端部に相当する部位10a 10の内周面17との接触部以外においては加熱ローラ 坂Pに相当する部位10b(図2参照))へと伝わり、 4 0 からの 加能 ローラ 1 0 以外への 放影曲 が少なく な がって慰御も)領単でウォームアップ時間も超くて済

み、効率的に加黙ローラ10の結構方向における温度分 しかも、図1に示した従来技術においては、髙熱伝導性 **部村3が拡戦ローク1の数固に被触しているのか、 哲黙** ローラ1の数面が劣化しやすく、また、装置が大型化す るという難点があったが、この実施の形態の定着装置に よれば、高熱伝導性部材40が、中空パイプ状の加熱ロ ーラ10の内部に設けられていて加熱ローラ10の内周 面17と接触するので、加熱コーラ10の表面が劣化せ 布の均一化を図ることができるという効果が得られる。 装置も大型化しないという効果が得られる。

る。しかも、高熱伝導部材40がローラで構成されてい るので、高熱伝導部材40を例えば摺接部材で構成した いっ効果も得られる。さらに、この実施の形態がは、図 4に示したように、高熱伝導ローラ40の装面(加熱ロ ーラ10の内周面17との接触面)を、高熱伝導性の弾 性層41で被覆してあるので、加熱ローラ10の内周面 17との接触が確実かつ円滑になると同時に接触面積も さらに増大し、より一層効率的に加熱ローラ10の輪線 で、萬熟伝導性部材40と加敷ローラ内周面11との被 **軸面積が広くなり、一層効率的に加熱ローラ10の軸線** 協合に兄べて加製ローラ10の回覧負荷が超大しないと 方向における温度分布の均一化を図ることが可能とな 方向における温度分布の均一化を図ることが可能とな

(c) 複影伝導部女40%、加製ローラ10の回転方向 に関し、加圧ローラ20との圧接位置Nに対応する部位 18の下流近傍において加製ローラ10の内周面17と 接触するので、以下に説明するように、一層効率的に加 黙ローラ10の軸線方向における温度分布の均一化を図 ることが可能となる。すなわち、この種の定着装置にお いては、加熱ローラ10と加圧ローラ20との圧接部N を用紙Pが通過することで、両ローラ10, 20におけ る用紙Pとの接触部においては用紙 (およびトナー) に 敷が奪われ、非被触部においては用紙Pに熟が奪われな いため、仮に何らの手段も購じないとしたならば、加熱 ローラ10の軸線方向における温度分布は、加熱ローラ 10の回転方向に関し、加圧ローラ20との圧接位置N に対応する部位 18の下流近傍において若しく不均一に なりやすい。これに対し、この実施の形態の定着装置に よれば、高熱伝導部材40が、加熱ローラ10の回転方 向に関し、加圧ローラ20との圧接位置Nに対応する部 位18の下流近傍、すなわち加熱ローラ10の軸線方向 における温度分布が若しく不均一になりやすく、温度差 が大きくなりやすい位置において加熱ローラ10の内周 面17と接触するので、加熱ローラ10における高温部 (用紙との非接触部に対応する部位) 10aの熟が高熟 伝導部材40を介して低温部(用紙との複触部に対応す る部位) 105~効率的に伝わることとなる。したがっ て、一層効率的に加熱ローラ10の軸線方向における塩 度分布の均一化を図ることが可能となる。

たように、萬敷伝導部材40が、加敷ローラ10の回転 方向における用紙Pとの後触部位の温度が低くなる位置 に配置されているので、その低温部に対するヒータ15 **収分布の均一化を図ることが可能となる。しかも上述し** (d) ヒータ15が、加黙ローア10の回覧中心Oから し、加圧ローラ20との圧接位置Nに対応する部位18 の下流回すなわち上述したように加黙ローラ 10の輪線 からの繁供給が効率的になされることとなる。したがら て、一層効率的に加黙ローラ10の結繰方向における過 偏倚しており、かつ、加熱ローラ10の回転方向に関

ß

(b) 高黙伝導部材40がローラで構成されているの

5向に関し、加圧ローラ20との圧接位置Nに対応する 部位18の下流近傍において加熱ローラ10の内周面1 7 と接触するので、より一層効率的に加熱ローラ10の **軸線方向における温度分布の均一化を図ることが可能と** 

いし相当する部分には同一の符号を付してある。この実 **施の形態が上記第1の実施の形態と異なる点は、高駅伝** る。図5において、上記第1の実施の形態と回ー部分な 導部材40が、加幣ローラ10の回転方向に関し、加圧 ローラ20との圧接位置Nに対応する部位18の上流近 点にあり、その他の点に変わりはない。この実権の形態 [0018] <第2の実施の形態>図5は本発明に保る (図2における[1]-[1]端面に相当する図)であ 傍において加敷ローラ10の内周面17と接触している **定着装置の第2の実施の形態の要部を示す概略断面図** によっても第1の果核の形態による上記 (a) (b)

て加製ローラ10の内図画17と接触しているので、加 शっ一ラ10が用紙Pと接触する直前において、その軸 り、箱果として、安定した定着状態が得られることとな 0が、加熱ローラ10の回転方向に関し、加圧ローラ2 0との圧接位置Nに対応する部位18の上流近傍におい (d) と同様な効果が得られる。また、高熱伝導部材 4 線方向における温度分布の均一化が図られることとな

5。図6において、上記第1の実施の形態と同一部分な **極の形態が上記第1の実施の形態と異なる点は、高熱伝** 導部材が、2つ(40、40') 散けられていて、その 8の上流近傍において加製ローラ10の内周面17と接 性する点にあり、その他の点に変わりはない。この契核 の形態によれば、上記祭1、第2の実施の形態による作 [0019] <第3の実施の形態>図6は本発明に係る (図2における111-111端面に相当する図) であ いし相当する部分には同一の符号を付してある。この実 1 つの複繁伝導部材 4 0 が、加黙ローラ 1 0 の回覧方向 に関し、加圧ローラ20との圧接位置Nに対応する部位 18の下流近傍において加熱ローラ10の内周面17と 接触し、他の1つの高熱伝導部材40,が、前配部位1 定着装置の第3の実施の形態の要部を示す機略断面図 用効果が同時に得られることとなる。

[0020]以上、本発明の実施の形態について説明し たが、本発明は上記の実施の形態に限定されるものでは なく、本発明の要旨の範囲内において適宜変形実施可能

D請求項2以外の発明についたは、 高製伝導ローラ40 は、ローラではなく、加熱ローラ10の内周面17に褶 徴する部材で構成してもよい。 の高熱伝導部材40に対して接艦機構を設け、温度分布 が特に不均一になりやすい小サイズ紙(上配通紙領域P

特開2002-268430。

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(個)の小さな用紙)に定着させる場合にのみ、高駅伝 ズ紙))の場合には、当後させないことによって、使用 導曲材40を加載ローラ10の内圏面17に当後させ、 それ以外 (使用頻度の高い大サイズ紙 (例えばA4サイ 頻度の高い用紙に定着させるの場合におけるウォームア ップ時間を著しく短縮することができる。

◎高慙伝導部材40は2個以上設けてもよい。

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る。さらに、請求項2記載の定着装置によれば、一層効 一ラの軸線方向における温度分布の均一化を図ることが 面が劣化せず、装置も大型化しないという効果も得られ 率的に加熱ローラの軸線方向における温度分布の均一化 荷が増大しないという効果が得られる。請求項3記載の における温度分布の均一化を図ることが可能となる。請 ーラの軸様方向における温度分布の均一化を図ることが 「発明の効果」請求項1~6配載のいずれの定着装置に よっても、発散体的分の構造が(したがって制御も)筋 できるという効果が得られる。しかも、加熱ローラの教 を図ることが可能となると同時に、加熱ローラの回転負 定着装置によれば、一層効率的に加熱ローラの軸線方向 **水項4記載の定着装置によれば、安定した定着状態が得** より一層安定した定着状態が得られることとなる。請求 項6記載の定着装置によれば、より一層効率的に加黙ロ **単でウォームアップ時間も低くて液み、秘母色に加密ロ** られることとなる。請求項5配載の定着装置によれば、 2 ន

[図面の簡単な説明]

[図1] 本発明に係る定着装置の第1の実施の形態の要 部を示す概略正面図。 ജ

[図2] 阿上正整面図

[図3] 図2における部分省略111-111端面図。

【図4】 加幣ローラの拡大断面図。

部を示す棋略断面図(図2における111-[[|雄面 【図5】本発明に係る定権装置の第2の実施の形態の要 に相当する図)。

[図6] 本発明に係る定着装置の第3の実施の形態の要 部を示す供略断面図(図2における111-111端面 に相当する図)。

[図 1] 従来技権の説明図。 4

(年中の説明)

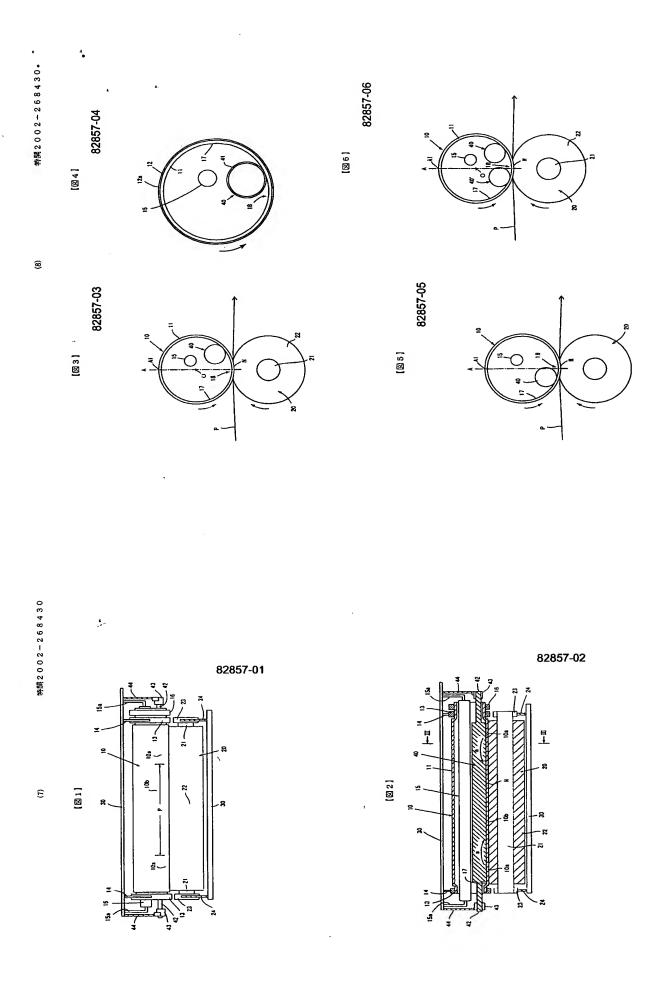
**岩幣ロール** ヒータ 0

内园街

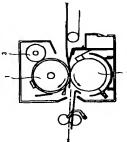
加圧ローラ

祖慙伝導ローラ (趙黙伝導部材) 40

圧接位置



[区]



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